REMARKS/ARGUMENTS

Applicants respectfully request reconsideration of this application in view of the foregoing amendments to the claims and the following comments.

Summary of the Office Action and Response

In the Office Action dated November 7, 2006, claims 13-32 were examined and rejected as follows:

- Claims 13-32 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over U.S. Patent No. 6,638,450 to Richard (the "Richard patent") in view of U.S. Patent No. 5,110,514 to Soane (the "Soane patent") and U.S. Patent No. 4,929,707 to Nagata et al. (the "Nagata patent").

- Claims 13-32 were rejected on the grounds of nonstatutory obviousness-type double patenting, as allegedly unpatentable over claims 1-17 of U. S. Patent No. 6,391,231 to Evans (the "Evans patent") in view of the Richard patent.

Applicants respectfully traverse these rejections for the reasons set forth below.

In response to the rejections, Applicants have amended independent claims 13, 23, and 27, to more particularly define the method of the invention and thereby to distinguish more clearly over the cited patents. No new matter has been introduced by these amendments.

These amendments, and the distinctions of the claimed invention from the cited patents, are discussed below.

The Rejection Under 35 U.S.C. § 103(a)

The present invention resides in a method of manufacturing an optical-quality polarized part, using a mold cavity defined in part by a special sidefill gasket and

using a special liquid-phase polymeric material to form a high-impact polyurethane-based optical construct.

In the § 103(a) rejection, the Examiner relied on the Richard patent for its disclosure of a basic injection molding apparatus incorporating a mold cavity defined in part by a sidefill gasket, and he relied on the Nagata patent for its disclosure of a high-impact polyurethane material. The Examiner admitted, however, that the Richard and Nagata patents fail to teach the use of an "adjacent reservoir for supplying liquid-phase material [into the mold cavity] as the admitted material shrinks during cure." Nevertheless, the Examiner asserted that the Soane patent makes up for this deficiency, as follows:

> Soane -514 discloses admitting liquid lens forming material into a mold such that the filling is vented and a reservoir continues to add material as the material in the cavity polymerizes and shrinks. It is submitted that such is fairly conventional in the art and that one of ordinary skill would have modified the method of Richard as taught by Soane -514 to ensure the cavity is packed as desired prior to the compressing.

Office Action dated November 7, 2006, page 2.

Applicants respectfully disagree that the thermoplastic injection molding apparatus of the Richard patent incorporates the required "side fill *gasket*." A gasket is defined as follows by the American Heritage Dictionary:

> gasket (n): Any of a wide variety of seals or packings used between matched machine parts . . . to prevent the escape of a gas or fluid.

Richard's injection molding apparatus thus lacks any gasket at all. Instead, as shown in FIGS. 4 and 5 of the patent, the molding apparatus incorporates a collar *encircling* (i.e., not between) the two mold halves 24, 26 and defining a flow control gate 42 for directing the thermoplastic material into the mold cavity 18.

Applicants further disagree that it would have been obvious to have modified the injection molding apparatus of the Richard patent to incorporate a reservoir like that of the Soane patent. This is because the structures of the Richard and Soane patents are configured for *different* kinds of materials and, consequently, are inherently incompatible with each other.

The Richard patent's injection molding apparatus is configured for use with *thermoplastic* materials. Thermoplastic materials soften and liquefy only when heated, and they re-harden when subsequently cooled. This softening and re-hardening cycle can be repeated many times without significantly changing the thermoplastic material's physical properties. Thus, if the mold part is flawed, the material can be re-melted and remolded.

Further, the thermoplastic nature of the material injected into Richard's mold cavity allows it to remain in its liquid, flowable state for as long as it remains above a prescribed elevated temperature. That allows the material to be injected at a low flow rate in the range of 0.8 to 3.5 g/min [Richard patent, at col. 7, lines 16-17]. As will be discussed below, this low flow rate is incompatible with the method of Applicants' claimed invention, which involves a polymeric material formulated to set within about 30 seconds.

Further still, the thermoplastic material injected into Richard's mold cavity can be compressed, to conform the material closely to the mold surfaces [*See*, Richard patent, at col. 2, lines 45-50]. This requires the mold cavity to be enclosed, with no outlet for the soft material to escape during such a compression step. The presence of an adjacent reservoir, therefore, could defeat such pressurization.

In contrast, the casting apparatus of the Soane patent is configured for use with *thermoset* materials. Thermoset materials are part of a broader category of materials discussed in Soane, which are initially liquid but which crosslink and harden to a solid form when exposed to an energy source. This crosslinking is usually irreversible, due to

chemical bonding changes in the material. Thermoset materials may shrink during the crosslinking reaction, due to shorter bond lengths and/or molecular rearrangements.

Thermoplastic materials can be analogized to a wax, which can undergo reversible transformations between liquid and solid states, simply by heating and cooling. In contrast, *thermoset* materials can be analogized to an egg, which when cooked cannot be returned to its uncooked state. Each material responds to heating and cooling in a distinctly different way. Persons skilled in the art readily understand that apparatus configured for processing one of these materials would not necessarily be appropriate for processing the other.

With reference again to the Richard patent, the disclosed injection molding apparatus injects a melted thermoplastic material into a mold cavity 18 at the side of a wafer 12 via a flow control gate 42. This gate is specifically configured to prevent rearward flow out of the cavity. The patent states as follows regarding this gate:

> The quick solidification of the thermoplastic material in the flow control gate 42 upon the stoppage of flow prevents the flow of thermoplastic material back from the mold cavity 18 through the flow control gate 42 during compression.

Richard patent, col. 7, lines 25-29.

The Soane patent discloses a casting apparatus configured to cast liquefied material that is solidified only upon exposure to a movable source of energy [col. 3, line 57–col. 4, line 6]. Soane's apparatus incorporates a reservoir 20 that supplies liquid-phase polymeric material to an adjacent mold cavity 16 as the previously admitted material shrinks during cure. This open, refilling reservoir thus functions in a manner directly *opposite* that of the Richard patent's flow control gate 42. Furthermore, the Soane patent makes a clear distinction between its own *thermoset* methods and the *thermoplastic* molding methods of others [*See*, Soane patent, at col. 5, lines 36-51].

The high-impact polyurethane-based material processed in the method of the claimed invention is unusual in that, while the material may require hours at elevated

temperature for complete polymerization [paragraph 0050], it sets within merely about 30 seconds upon mixing the reactant components [paragraphs 0047-0049]. This is a non-reversible reaction. Thus, the material behaves differently from typical thermoset materials as well as typical thermoplastic materials. Because of this different behavior, Applicants were driven to investigate new ways to handle the material [paragraph 0048]. The result was a new method of manufacturing optical-quality polarized parts, as defined in claims 13-32.

By this Amendment, Applicants have amended independent claims 13, 23, and 27, to more particularly define the method of the invention and, thereby, to distinguish more clearly over the disclosures of the Richard, Soane, and Nagata patents. Specifically, claims 13, 23, and 27 now all define a method of manufacturing a polarized part (or lens) utilizing a sidefill gasket including one or more inlet port holes and an adjacent reservoir for admitting liquid-phase polymeric material into a mold cavity, and forming an high-impact polyurethane-based optical construct from liquid-phase polymeric material "formulated to set within about 30 seconds." This recited attribute of the polymeric material is supported by paragraphs [0010] and [0047]-[0049] of the written description. None of the cited patents disclose a method utilizing a sidefill gasket with one or more ports and a reservoir, to form a high-impact polyurethane-based optical construct from liquid-phase material formulated to set within about 30 seconds.

In summary, the Richard patent discloses an injection molding method that uses a flow control gate to stop the flow of material into and out of a mold cavity, appropriate for controlling compressive molding of a *thermoplastic* material. The Soane patent discloses a casting method that uses a reservoir to refill a mold as the previously admitted *thermoset* material shrinks during cure. Neither the Richard patent nor the Soane patent discusses forming a high-impact polyurethane-based optical construct by admitting into a mold cavity a liquid material formulated to set within about 30 seconds.

The Nagata patent fails to make up for the deficiencies of the Richard and Soane patents. The Nagata patent was cited merely for its teaching of a high-impact

polyurethane (actually a sulfur-containing polyurethane). The patent does mention time durations of its polymerization, but states that they are from 0.5 to 72 hours [Nagata, at col. 6, lines 12-13]. In addition, Nagata's Examples 1A and 1B require 48- and 24-hour cures.

Combining the Richard, Soane, and Nagata patents fails to render obvious Applicants' invention of manufacturing a polarized optical part using a sidefill gasket that includes both one or more inlet port holes and a reservoir, and forming a high-impact polyurethane-based optical construct by admitting into a mold cavity a liquid material formulated to set within about 30 seconds, as called for in the Applicants' amended claims.

For these reasons, the § 103(a) rejection of claims 13-32 is improper and should be withdrawn.

The Non-Statutory Double-Patenting Rejection

As mentioned above, claims 13-32 also were rejected on the grounds of nonstatutory obviousness-type double patenting, as being allegedly unpatentable over claims 1-17 of U. S. Patent No. 6,391,231 to Evans (the "Evans patent") in view of the Richard patent. The Examiner commented on this rejection as follows, at page 3 of the Office Action:

> Although the conflicting claims are not identical, they are not patentably distinct from each other because the previously allowed US Patent -231 and the instant application essentially set forth the same invention, wherein a polarizer film is embedded within an injection molded lens, the patent at best failing to claim that the gasket is a sidefill gasket. As taught by Richard, such is well known and would have been an obvious modification to the method of -231 to facilitate admission of the liquid material.

Applicants respectfully disagree with the Examiner's assertion that the claims of this present application are not patentably distinct from claims 1-17 of the Evans patent.

First, the Evans patent does, in fact, disclose and claim a method for making a polymer lens using a *side-fill gasket*. Indeed, the title of the patent is "Method for *Side-Fill* Lens Casting." Second, neither the Evans patent nor the Richard patent discloses or suggests applicability to high-impact polyurethane-based materials formulated to set within about 30 seconds, as set forth in all of claims 13-32.

For these reasons, the non-statutory double patenting rejection based on the Evans patent in combination with the Richard patent is improper and should be withdrawn.

Conclusion

This application should now be in condition for a favorable action. Issuance of a notice of allowance is respectfully requested. If the Examiner believes that a telephone conference with Applicants' undersigned attorney of record might expedite the prosecution of this application, he is invited to call at the telephone number indicated below.

Respectfully submitted,
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